



VACUUM TECHNICS & TECHNOLOGIES

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ferryvatt.ru



28

More than 28 years on the market of vacuum equipment manufacturers

150

More than 150 completed projects for the development and manufacture of high-tech equipment

12

12 countries in which our equipment is operated

ABOUT COMPANY

FERRY VATT LLC develops and manufactures vacuum equipment for solving a wide range of science and industry problems.

The company was established in 1991 by leading employees of the research and production association of Vacuum mechanical engineering «VACUUMMASH» in the city of Kazan and continues to develop more than half a century of Russian industry experience.

Today, the company has its own production, research and development center, design office, which allow to solve unique problems in a short time. Our employees are graduates of the leading Russian departments of vacuum and plasma technology at the Kazan National Research Technological University, Bauman Moscow State Technical University. The expertise of our team is confirmed by numerous scientific articles, diplomas and awards, as well as the choice of the Customer – state corporations, universities, research and development centers of industrial enterprises.

We take a personalized approach to each problem, we do not get solutions into standard templates, so our customers choose us.

We are always open to development with you!

HISTORY



Establishment of the company
First generation of vacuum units

1991



Access to the markets of the CIS and Eastern Europe

1998



Access to the international markets of Western Europe and the Middle East

2005



ATT 600x1200M-ED and VATT 600-6 IMD pass-through vacuum lines

2006-2009



VATT 4000/5000 series of vacuum winding units

2013-2014



Company rebranding
Third generation of vacuum units

2019

1995

VATT 1600 series of vacuum units



2000

Company rebranding
Second generation of vacuum units



2007

VATT 900 series of vacuum units



2012

VATT UZP-800 series of single crystal zone melting units

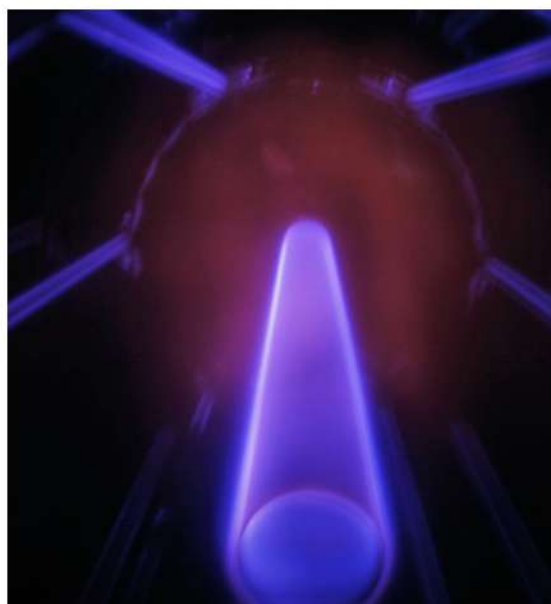


2015

VATT-5-VKP2,8 vacuum impregnation line



DIRECTIONS



COATING DEPOSITIO

Technologies and equipment for deposition of functional coatings

- Vacuum thermal evaporation
- Magnetron sputtering
- Arc evaporation (Arc-PVD)
- Electron beam evaporation (EBC)
- Ion-beam sputtering (IBAD)
- Gas phase chemical deposition (CVD, PECVD, ALD)
- Gas-thermal plasma sputtering (APS, VPS)

PLASMA TREATMENT

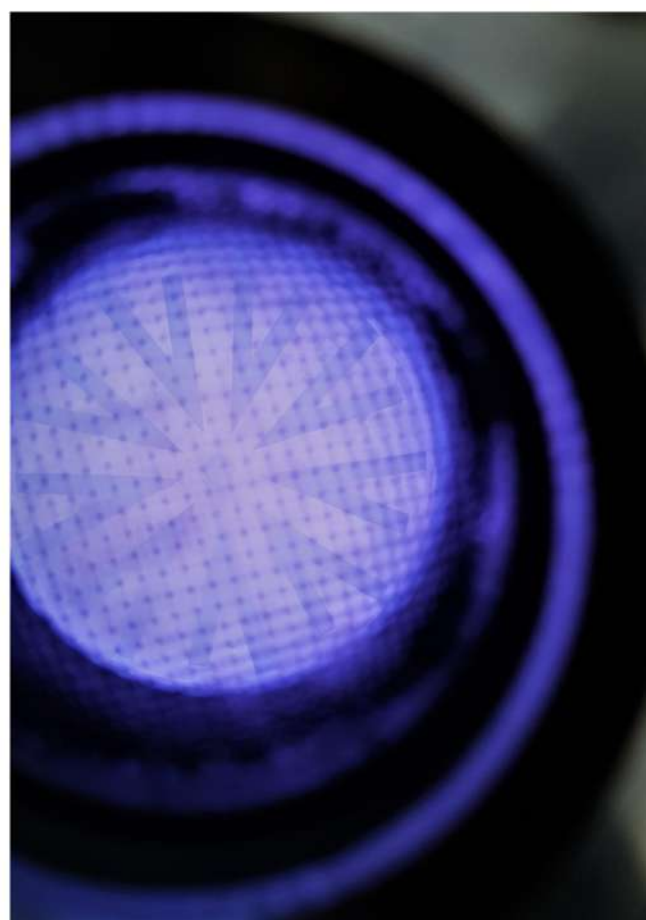
Technologies and equipment for processing various materials in radio frequency (RF) low-pressure plasma

Plasma etching technologies

- Reactive ion etching (RIE)
- Plasma etching (PE)
- ICP reactive ion etching (ICP Etch)

Plasma physical RF treatment technologies (RFPT)

- Adhesion surface activation
- Plasma chemical heat treatment (nitriding, carburizing)
- Plasma cleaning, sterilization
- Plasma polishing



VACUUM IMPREGNATION AND FORMING

Composite molding

- Vacuum infusion;
- Injection (RTM);
- Vacuum injection (Light - RTM);
- Spraying;

Vacuum impregnation

- Impregnation of porous alloys
- Impregnation of electric windings



VACUUM TESTING

- Space simulation
- Thermo-cryo-vacuum tests
- Electric rocket engines tests



VACUUM HEAT-TREATMENT EQUIPMENT

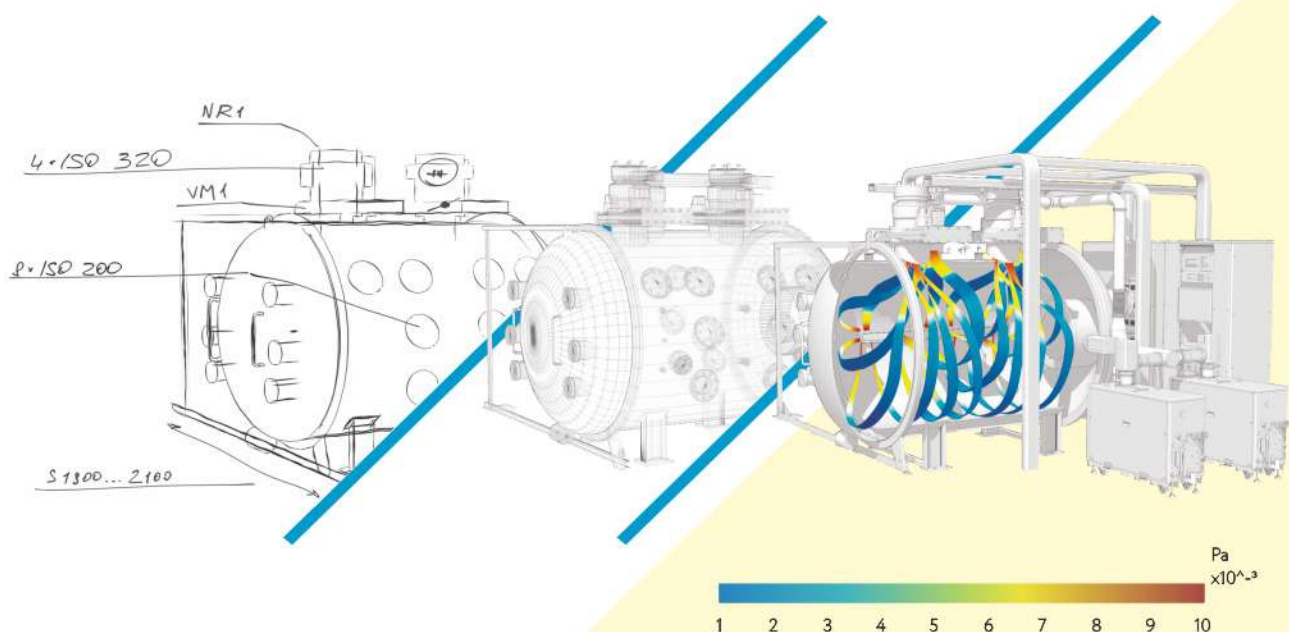
- Vacuum furnaces
- Vacuum melting
- Single crystal growth

SPECIAL TECHNOLOGIES

- Vacuum drying and thermal modification of wood
- Vacuum freeze dryings

WE IMPLEMENT FULL CYCLE OF YOUR APPLICATION

- FROM IDEA TO IMPLEMENTATION



IDEA

The right choice of equipment layout is the strategic stage of the project. Many years of experience in creating vacuum equipment for a wide range of problems allows to make the right key decisions at the initial stages.

DEVELOPMENT

Professional use of CAD/CAE tools for designing and modeling physical processes allows to solve unique design problems of any complexity in the shortest possible time and eliminate production costs

IMPLEMENTATION

- Own production
- Quality control
- Use of reliable components
- Testing and optimization of technologies in the presence of the Customer
- Personnel training
- After-sales support

TECHNOLOGIES

- The R&D resource center allows to continuously improve technologies and to implement them in the new equipment
- ✦ We use modern technological sources of our own developments

AUTOMATION

- Convenient interface
- Manual and automatic control
- Programming of technological cycles
- Reporting
- Multilevel access
- Remote control

SERVICES

FERRY VATT provides a full range of services in the field of vacuum technology. Our motto is the "Vacuum universe", and our mission is to help you in solving any problems associated with industrial vacuum.



ENGINEERING CONSULTING. Selection of technological solutions for various technical problems.



R&D. Technology development. Carrying out research and development work. Own R&D resource center



Equipment **DESIGN:** calculations, simulations, development of documentation according to National standards. Simulation and calculation of physical processes of vacuum and plasma equipment: mechanical, gas-dynamic, electromagnetic, heat transfer processes, simulation of plasma processes



Equipment **MANUFACTURING.** Own mechanical areas, electrical work, assembly and commissioning areas. Development of technologies within the company's resource center



SERVICE. Warranty and post-warranty service. Equipment condition audit

UPGRADING AND REPAIR. Restoration and upgrading of obsolete equipment

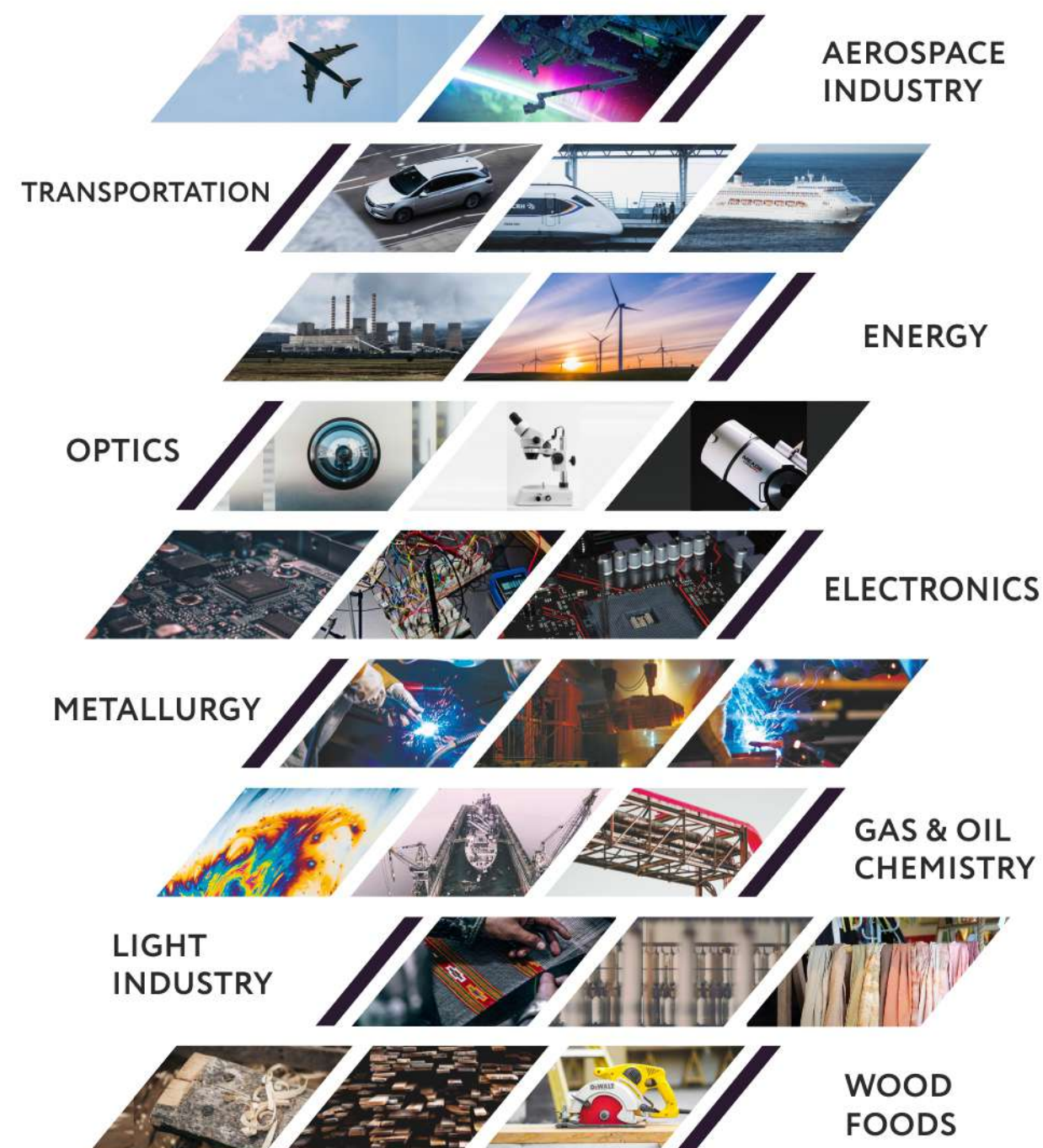
SALE of equipment and components of own development and third-party manufacturers



TRAINING of employees of enterprises in the following courses: fundamentals of vacuum/plasma equipment and technologies, project management, fundamentals of nanotechnology, computer-aided design of CAD-CAE-CAM technical systems

INDUSTRY SOLUTIONS

Vacuum technological solutions are widely used in various industries. FERRY VATT company is a "ferry" between industrial problems and effective solutions, the tool for which is the vacuum technology we create.



OUR ADVANTAGES



Long experience



Quality control



Certificates and licenses



We produce, but do not resell



We solve non-standard problems



Turn-key equipment and technology

The FERRI VATT quality control system is certified and meets the requirements of ISO 9001, welding equipment and personnel are certified according to the requirements of National Agency for Testing and Welding, managers and engineering staff are certified according to the qualification standards of the Interindustry Association of Nanoindustry. Our developments have been repeatedly awarded with prizes and diplomas at international exhibitions.

OUR CUSTOMERS



PRODUCT CATALOG

VACUUM COATING DEPOSITION UNITS



VATT 200-2MR

Laboratory magnetron sputtering unit

Laboratory magnetron sputtering unit consisting of two sputtering chambers based on one vacuum station. First chamber: 3 magnetrons, 1 ion source (L=560 mm) and 3 magnetrons, 1 ion source (d=100 mm). Second chamber: 4 magnetrons and 1 ion source (d = 40 mm).

VATT 300-EL/SV

Obtaining ultra-pure nanoscale metal films

Ultra-high-vacuum plant (10⁻⁵ mm Hg) for obtaining by electron-beam method of ultra-pure films with a thickness of 1–5 nanometers for a fundamental research of the properties of nanoscale materials.



VATT 400-2M-Bin

Application of binary structures of nanometer thickness



The unit is designed for magnetron production of binary structures of metals with a layer thickness of 5–10 nanometers with a total film thickness of up to 50 μm for applied research.

VATT 400 I4M

Deposition of resistive alloys



Deposition of resistive alloys on special products, functional coatings for microelectronics. Thickness control with the help of a marker, a quartz meter, by time and by the dose of energy spent on the deposition of the layer.

VATT 400 IR2M

Deposition of metal films on flat ceramic substrates

Sputtering on substrates of ceramics, sitall, ferrites, multilayer coatings based on copper, aluminum, chromium, titanium, tantalum, resistive alloys by magnetron sputtering in high vacuum.



VATT 400

Deposition of coatings on semiconductors

Small-scale precision sputtering of substrates by magnetron evaporation. It is used in microelectronics and semiconductor production to spray metals and their oxides on a semiconductor substrate.

VATT 300SH-2MIT

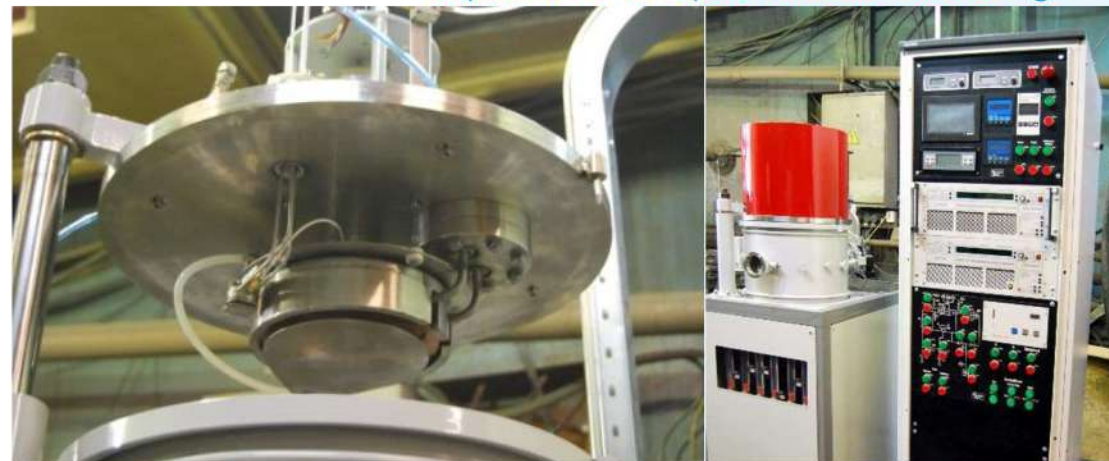
Deposition of optical coatings by magnetron method



Magnetron sputtering unit with the loading of the substrate with a diameter of 130 mm through the gateway for the deposition of optical coatings.

VATT 450MS

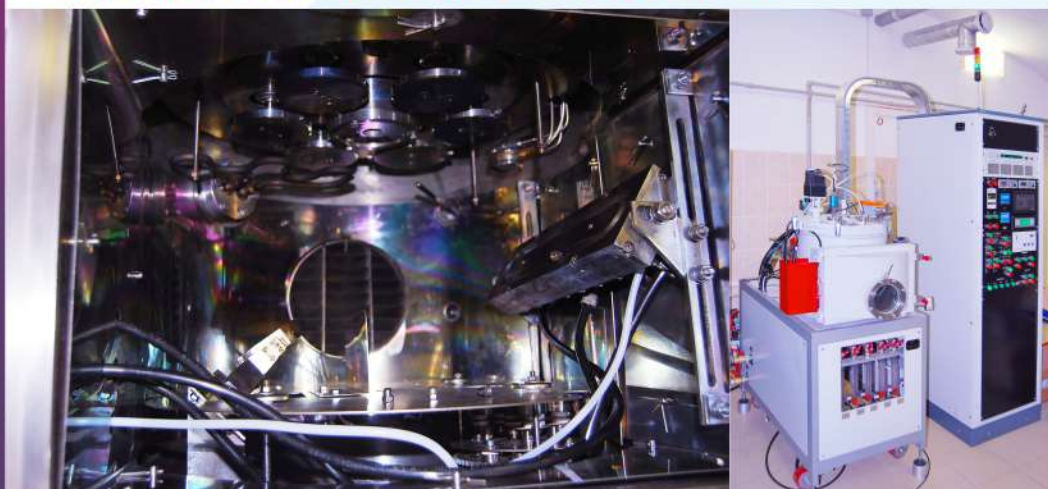
Deposition of transparent conductive coatings



Magnetron deposition of InO -SnO transparent conductive coatings.

VATT 450GE

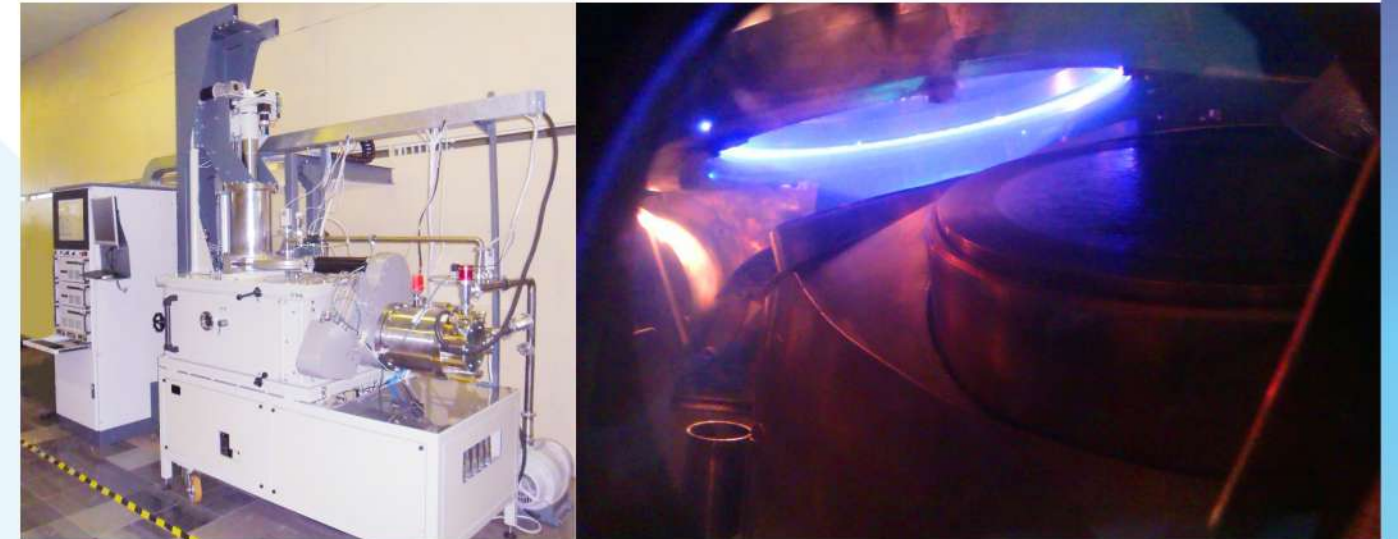
Deposition of optical coatings by laser evaporation



Creation of thin-film optical coatings by laser ablation.

VATT 900SH-6L3MO

Deposition of optical coatings by ion-beam and magnetron methods



Deposition of optical coatings, including IR-band. Single-beam optical control with the ability to scan the spectrum in the range of 380–2700 nm by transmission (reflection) with the output of the resulting spectrum on a computer screen. Ion source for cleaning, ion-beam sputterer with a positioner for three targets, three magnetrons; sputtered materials: Ti, Ta, Si, Ge, MgF₂, ZnS.

VATT 900-2EL

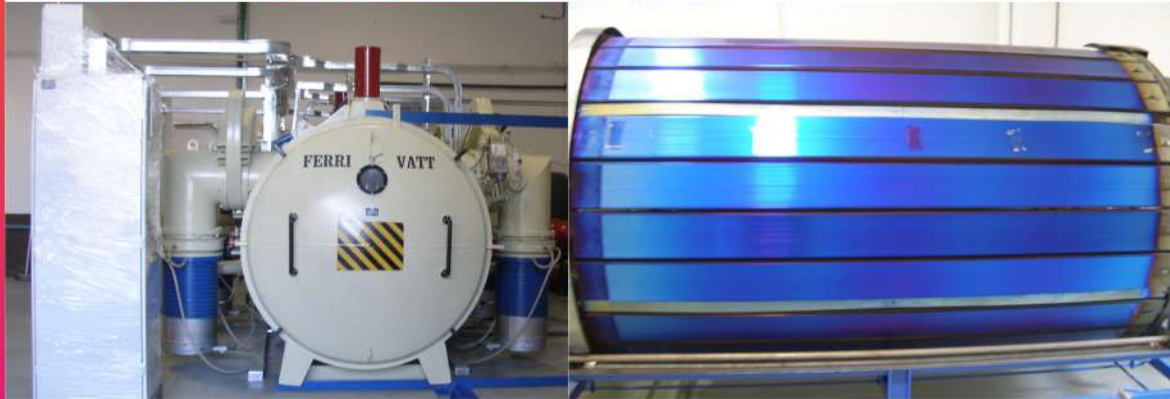
Deposition of optical coatings by electron-beam and resistive method

Deposition of multilayer optical coatings in the wavelength range of 250–1100 nm, an integrated optical monitor, an ion assist source, two electron-beam evaporators, 12-position magazine for test objects, and 6-position magazine for crystal oscillators.



VATT 1600-DK

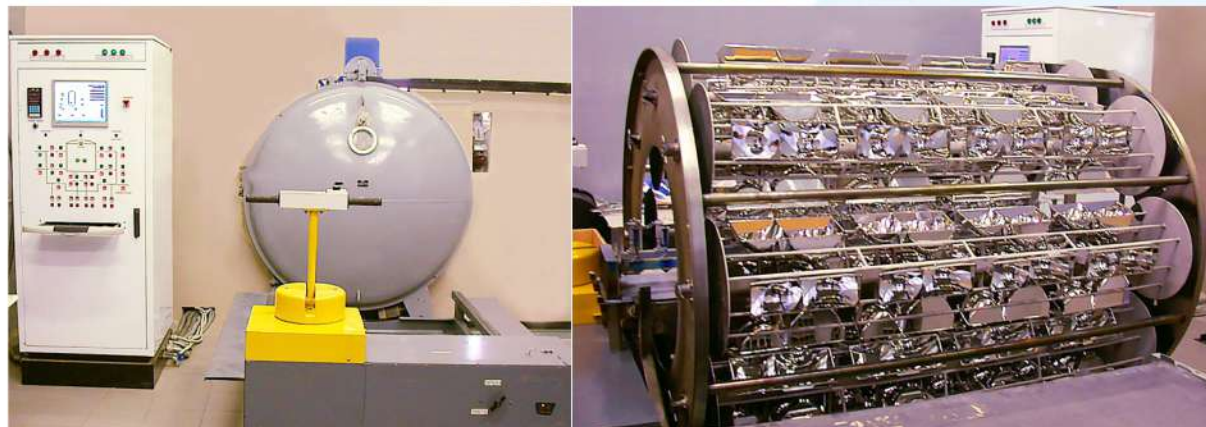
Deposition of coatings on solar collector panels



The unit is designed for applying a combined coating on solar collectors.

VATT 1600-TK

Application of coatings on headlight reflectors



The unit is designed for applying a combined reflective coating. The coating can be applied to various reflective elements, including metal or plastic reflectors of car headlights.

VATT 1800-DK

Deposition of coatings on solar collector panels



The unit is designed for sputtering and ion-beam orientation of the textured oxide coating on metal tape substrates to ensure the release of high-temperature superconductors.

VATT 700-M2-I1-S

Deposition of coatings on solar collector panels

The unit is designed for applying decorative coatings on the interior elements of aircraft equipment by magnetron sputtering, includes two extended magnetrons, a system of ion cleaning of substrates and a system for supplying the displacement potential on the products. Planetary rotation mechanism. Heating up to 300 °C. Types of sputter coatings – metals and compounds. Sputtering zone height – 600 mm, diameter – 500 mm.



VATT-43-4D-2I

Application of hardening coatings on the blocks of turbine nozzle vanes



Coatings: condensation diffusion (Me-Cr-Al-Y + Al-NiY (Me-Ni; N-Co)), hardening coatings (TiN, ZrN, TiC, CrC, TiCN), nanolayer coatings (TiN/CrN) on turbine rotor blades and blocks of nozzle vanes made of high-temperature alloys of steels and titanium alloys. Technological sources: 4 arc sputterers with a rotating cathode and a magnetic system for holding a cathode spot with an arc current of up to 1000 A, 2 ion sources. Substrate temperature is 650 °C. Optical plasma control system. Universal mechanism with a floating axis of rotation for placing products with a diameter of 300–903 mm, a width of 50–140 mm with an electric displacement of 50 A, 650 V.

VATT900-3DI

Deposition of coatings on solar collector panels

Vacuum arc application of hard, wear-resistant, tribological and protective coatings based on 2D and 3D nanocomposites on tools and machine parts. Deposition zone height is up to 1200 mm, diameter – up to 700 mm.



VATT 900-4M

Deposition of decorative coatings

Magnetron deposition of hard and protective nanocomposite-based coatings on tools, machine parts, metal hardware, including those made of zinc-containing alloys. Deposition zone height is up to 1200 mm, diameter – up to 700 mm.



VATT 900- 2M2DS

Deposition of hardening and wear-resistant coatings on tools



Deposition of hardening and wear-resistant coatings by arc, magnetron and combined methods. Deposition zone height is up to 1600 mm, diameter – up to 700 mm.

VATT 1600x2400-ED

Deposition of coatings on glass



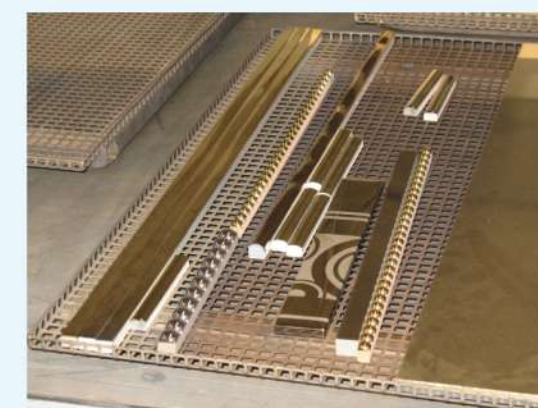
Deposition of tinting and mirror coatings on sheet glass 1680x2400 mm in size.



VATT 600x1200-ED

Deposition of decorative coatings on ceramic tiles

The unit is designed for deposition of metals and compounds on ceramic glazed tiles and glass.



VATT 3000-ED

The unit is designed for arc deposition of multilayer coatings on the basis of: metals and their compounds on architectural glass in size of 3210x2250. Built-in optical control system in the range of 350–720 nm.



VATT 4500-4M

Deposition of hardening coatings on large substrates

The unit is designed for two-sided hardening coatings on substrates up to 3000x1500x150 mm and weighing up to 500 kg.



VATT600-6IMD

Deposition of coatings on thermoelement substrates

High-performance pass-through unit for two-sided deposition of barrier layers to layers for brazing on TeBi substrates to obtain new generation thermoelectric elements.



VATT - 44

Deposition of decorative coatings



Pass-through four-chamber continuous unit with 2 deposition modules with the ability to connect magnetrons in dual and quadrupole circuits.

Coatings: thermal barrier ceramic layers of Zr-Y, Nd-Zr oxides, Gd-Zr etc. on turbine blades made of high temperature alloys. Coating thickness is 50–100 μm. Pre-heating temperature is 600 °C, deposition heating temperature – 850 °C. Electric displacement: 20 A, 200 V.

VATT 450PCh

Deposition of coatings on glass



The unit is designed for chemical vapor deposition using a glow discharge plasma at a constant current and RF potential.

VATT 200 ALD

Atomic layer deposition (ALD)



The unit provides atomic layer deposition on solid, dispersed and porous samples. It provides the use of gaseous, liquid and solid reagents as precursors. High density and uniformity of the coating with precision accuracy in thickness on the substrate of complex geometry and shape. The pumping-out system is implemented on the basis of a chemical-resistant rotary vane pump with an oil filtration system. Nitrogen and zeolite traps are located upstream of the pump.

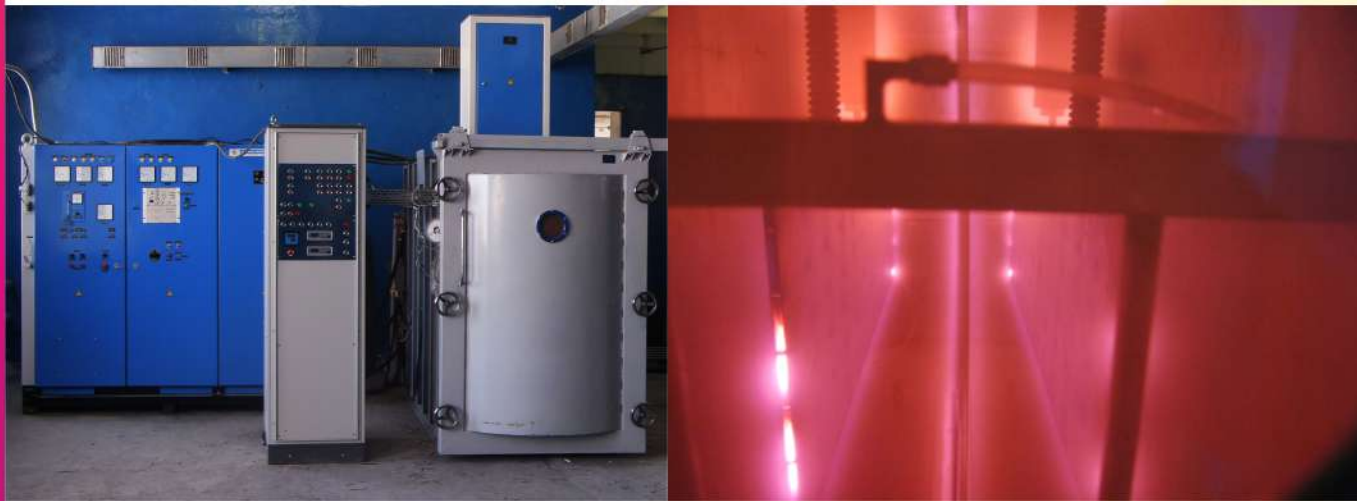
Automatic water flow control. Processes are controlled by a mass spectrometer. The unit ensures that the process is carried out in an automatic mode with all the steps and process parameters stored in the computer memory.

The equipment includes a reactor for flat and bulk substrates, a suspended bed reactor, 2 lines of hard-boiling components, 4 lines of liquid precursors, 2 lines of active gases. This technology is used for micro- and nano-electronics, photovoltaics, lighting (LED and OLED), medicine optics, jewelry and watch products.

PLASMA TREATMENT VACUUM SYSTEMS

VATT 1600x2500 Plasma

Deposition of coatings on thermoelement substrates



Surface activation, improved coloration.

VATT 4000 PT Plasma

Plasma treatment of rolled materials



Single-chamber batch plant for low-pressure HF plasma treatment of roll fabrics made of high-molecular polymers, fabrics made of natural, synthetic and mixed fibers.
Roll sizes – diameter up to 500 mm, width up to mm, weight up to 250 kg.

VATT 500I

Plasma etching of microelectronics

Automated vacuum unit for ion-chemical etching to remove photoresist, for cleaning semiconductor wafers and dry etching pattern on semiconductor materials.



VATT VChPU-OM

Plasma treatment of rolled materials

Automated vacuum unit for ion-chemical etching to remove photoresist, for cleaning semiconductor wafers and dry etching pattern on semiconductor materials.

PlasmaModular

Desktop RF plasma systems

Plasma Modular series equipment is a modular desktop vacuum system for radio frequency (RF) plasma treatment (RFPT) of various materials and is designed to solve a wide range of technological problems such as etching, surface activation, cleaning, sterilization, polishing. CCP, ICP sources. Plasma diagnostics.



VACUUM IMPREGNATION AND MOLDING

VATT 80-VKP/4

Vacuum impregnation of coils



Vacuum impregnation with varnish (FL-98) and drying of winding products of electrical equipment with sizes up to 120x200x200 mm.

VATT-5-VKP/2.8

Plasma treatment of rolled materials

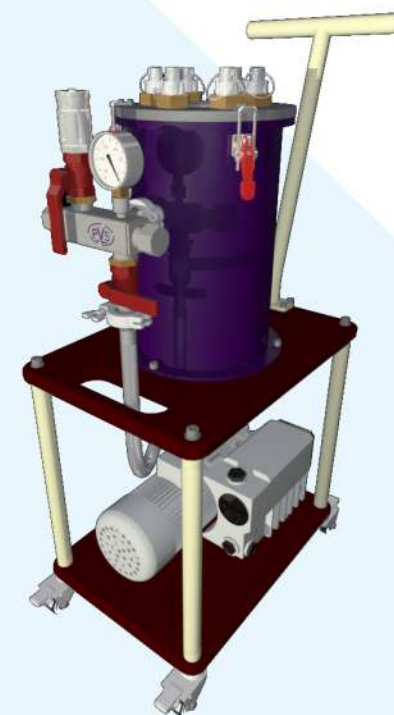


The impregnation line is designed for sealing castings of aluminum and magnesium alloys by vacuum compression (4–7 atm.) impregnation

VATT 125-25P

Vacuum impregnation of windings

Two-chamber batch unit consists of a degassing chamber and an impregnation chamber. It is intended for impregnation of transformer windings in vacuum conditions with polyurethane or silicone compounds, with its preliminary degassing.



InForm

Vacuum infusion of composites

Line of universal mobile vacuum systems for molding composite materials with various technologies: vacuum infusion; infusion with a double bag; vacuum injection (RTM Light); vacuum molding; premolding.

VACUUM TEST EQUIPMENT

VATT-0.8 TVI

Thermal vacuum testing



VATT-1.0 VO

Thermal vacuum cycling tests



VATT-KTVU

Cryovacuum testing



VATT-UVO

Calibration of vacuum gauges



VATT UZP-800

Melting of refractory single crystals

The unit is designed for refining and obtaining single crystals of refractory metals W, Mo, Ta, Nb up to 800 mm in length and 40 mm in diameter. Zone melting is carried out by a ring electronic source using the "floating zone" method with a vertical arrangement of the ingot.

The control system provides the manual and automatic treatment. In the automatic mode of remelting process control, the video control system is used, which allows the operator to observe the crystal growth on the monitor screen, control the process parameters, and, if necessary, allows to switch the control system to manual mode to adjust the parameters



VATT-1300VIP-S

Vacuum melting furnace

The vacuum unit is designed to produce innovative aluminum and magnesium alloys in vacuum in an induction furnace followed by casting thereof in a muffle furnace, with the possibility of adding nanomodifiers in the melt and ultrasonic melt treating both in the process of melting when alloying and before solidification when casting into molds. Crucible steel capacity is 45 kg.

